1970 OPERATING SUMMARY

TIMMINS

water pollution control plant

ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

Water management in Ontario

Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario

Once again we have the privilege of submitting to you our latest detailed report on financial progress and technical activity at your water pollution control plant.

The statistical information contained in this annual operating summary will undoubtedly be a useful barometer of efficiency. Of particular interest will be the comments and recommendations of the regional operations engineer, who was intimately connected with day-to-day operation throughout 1970.

Together with the extensive cost data provided, this information should assist greatly in your general understanding of the problems met and dealt with, and in furnishing a yardstick for possible future expansion.

D.S. Caverly,
General Manager.

D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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TIMMINS

water pollution control plant

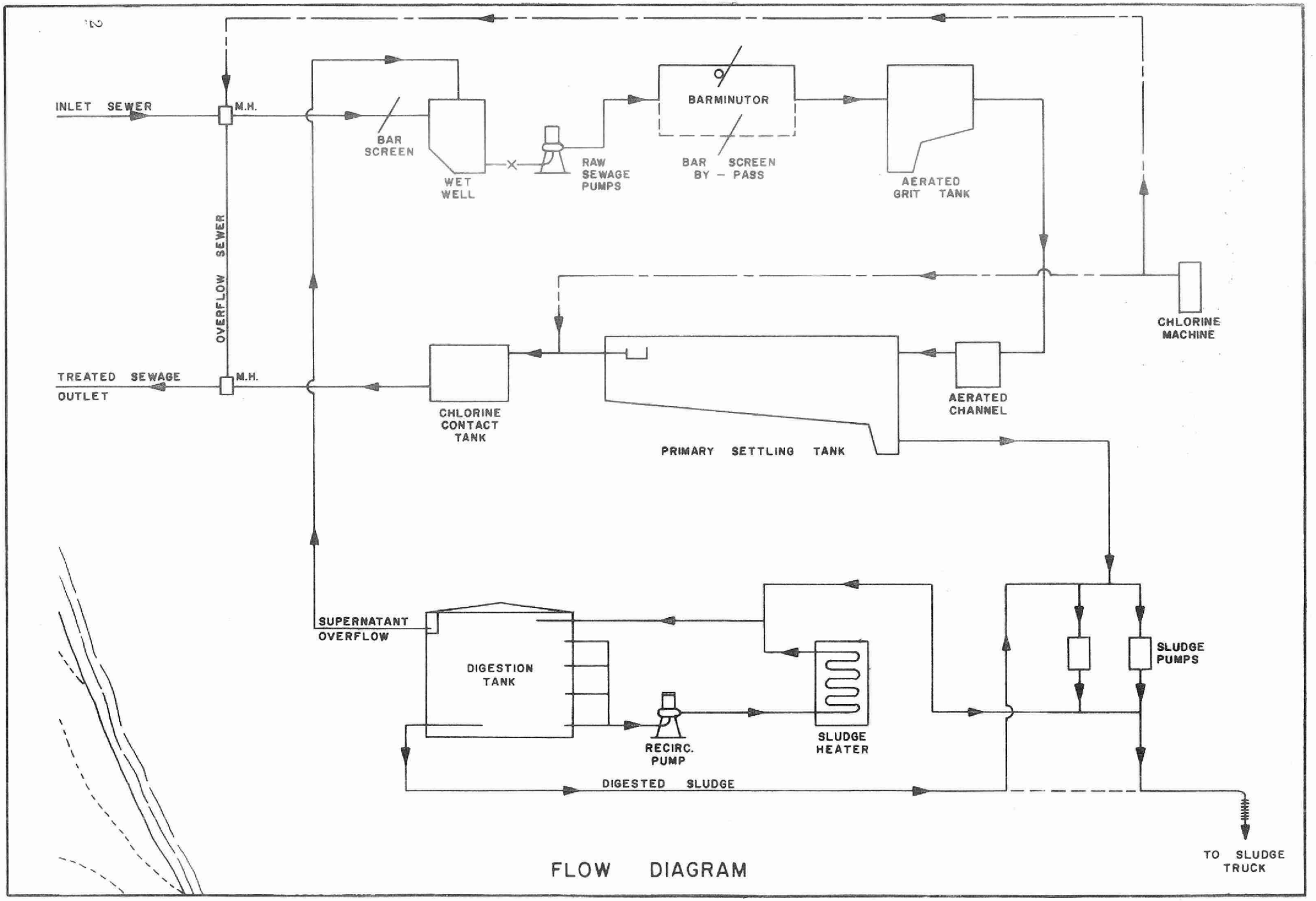
operated for

THE TOWN OF TIMMINS

by the

ONTARIO WATER RESOURCES COMMISSION

1970 ANNUAL OPERATING SUMMARY



FLOW DIAGRAM

DESIGN DATA

PROJECT NO.	2-0071-60	TREATMENT	Primary
DESIGN FLOW	3.0 mgd	DESIGN POPULATION	30,000
BOD - Raw Sewage	180 mg/l	SS - Raw Sewage	200 mg/l
- Removal	35-40%	- Removal	60-65%

RAW SEWAGE PUMPS

Screening

Type: Manually cleaned
Size: 2" opening

Pumps

Type: Worthington
Size: One 3650 gpm @ 26' tdh
One 3120 gpm @ 26' tdh
One 3120 gpm @ 26' tdh (diesel)

PRIMARY TREATMENT

Comminution

Type: Chicago Pump Barminutor
Size: One Model C (36")

Grit Removal

Type: Aerated
Size: One 13' x 18 3/4' x 12½' (19,000 gal)
Retention: 9.1 min
Air Supply: Two Sutorbilt

Primary Sedimentation

Type: Jeffrey
Size: Two 125' x 20' x 12' (avg) (374,000 gal)
Retention: 3.0 hr
Loading: Surface, 600 gal/ft^2/day
Weir, 9900 gal/ft/day

CHLORINATION

Type: F & P
Size: One 2,00 lb/day

Chlorine Contact Chamber

Size: Two 47½' x 7' x 9' 7" (37,400 gal)
Retention: 19 min

OUTFALL

- to Mattagami River

SLUDGE HANDLING

Digestion System - single-stage, concrete

Type: PFT (gas mixed)
Size: One 65' dia x 24' swd (80,000 cu ft or 0.50 mil gal)
Loading: 1.35 lb/cu ft/mo

'70 REVIEW

FLOWS	DAILY FLOW mil gal	OCCURRING IN THE MONTH OF	MONTHLY FLOW mil gal	OCCURRING IN THE MONTH OF
Average	3.24	—	98.54	—
High	5.80	December	112.2	December
Low	1.30	January	78.0	January

GENERAL

The Timmins plant is a three million gallon per day primary treatment facility. The treated effluent is discharged to the Mattagami River downstream of Timmins. The project is operated by a chief operator and two operators.

During the year the digester was cleaned out by using compressed air and an increased sludge haulage rate. With this work successfully completed, the operation of the new mixing system was facilitated. Among other work done during the year was insulating the gas withdrawl line on top of the digester with insulation and polyethene in order to prevent freezing. The main floor and barminutor rooms were painted. The primary tank shoes were replaced on the sludge scrapers and five cracked bearing housings were replaced on the collector mechanism.

EXPENDITURES

The operating cost for the year was $63,815.38, an increase of 7.5 percent over 1969. Areas of increased costs were payroll, fuel and repairs and maintenance.

PLANT FLOWS and CHLORINATION

The average daily flow increased by 0.34 million gallons over 1969. The average daily flow of 3.24 mgd was 108% of the nominal design capacity of 3 mgd.

The design daily flow was exceeded 55% of the time. However the wet weather design capacity of 9 mgd was not exceeded during the year. The final effluent was disinfected with 32,600 pounds of chlorine between May and November to give a residual of 0.5 mg/l.

PLANT EFFICIENCY

The average raw sewage BOD and suspended solids concentrations were 178 mg/l and 225 mg/l. These loadings are considerably lower than those of previous years. Average BOD and suspended solids reductions were 67% and 79% respectively, and represent good treatment for a primary facility.

A total of 520 tons of BOD and 700 tons of suspended solids was removed during the year. The final effluent concentrations were 58 mg/l BOD and 48 mg/l suspended solids.

A total of 6,300 cubic feet of grit was removed from the raw sewage. This represents an average of 5.3 cubic feet of grit per million gallons of sewage treated which is above normal and is usually indicative of combined sewers.

SLUDGE DIGESTION and DISPOSAL

A total of 10,520,000 gallons of raw sludge was pumped to the digester. The raw sludge averaged 2.5 percent total solids, 72 percent of which was volatile matter. The digested sludge averaged 3.8 percent total solids of which 61 percent was volatile. The average reduction in volatile matter was approximately 37 percent. A total of 3,230,000 gallons of digested sludge was hauled from the digester by tank truck. The increase from previous years is due to digester cleanout in April and May.

CONCLUSIONS

The project is operating very efficiently at average flows of 3.24 mgd. The design capacity of 3.0 mgd is conservative and good treatment can be expected up to average flows of 4.0 mgd.

PROJECT COSTS

2-0071-60

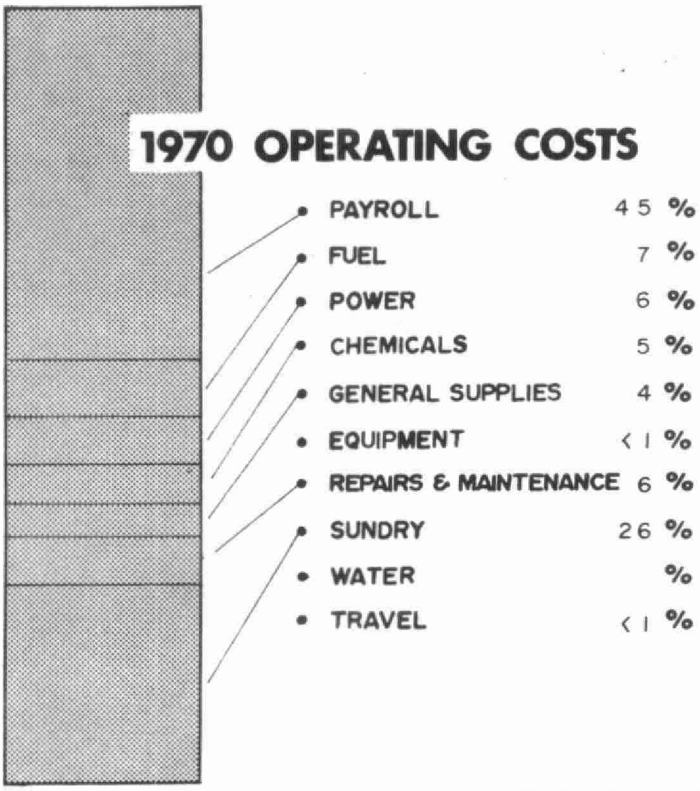
NET CAPITAL COST (Final)	$785,370.12
DEDUCT - Portion financed by CMHC/MDLB (Final)	521.108.36
Long Term Debt to OWRC	$264,261.76
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1970	$ 68,476.39
Net Operating	$ 63,815.38
Debt Retirement	9,587.00
Reserve	4,269.62
Interest Charged	14,805.59
TOTAL	$ 92,477.59

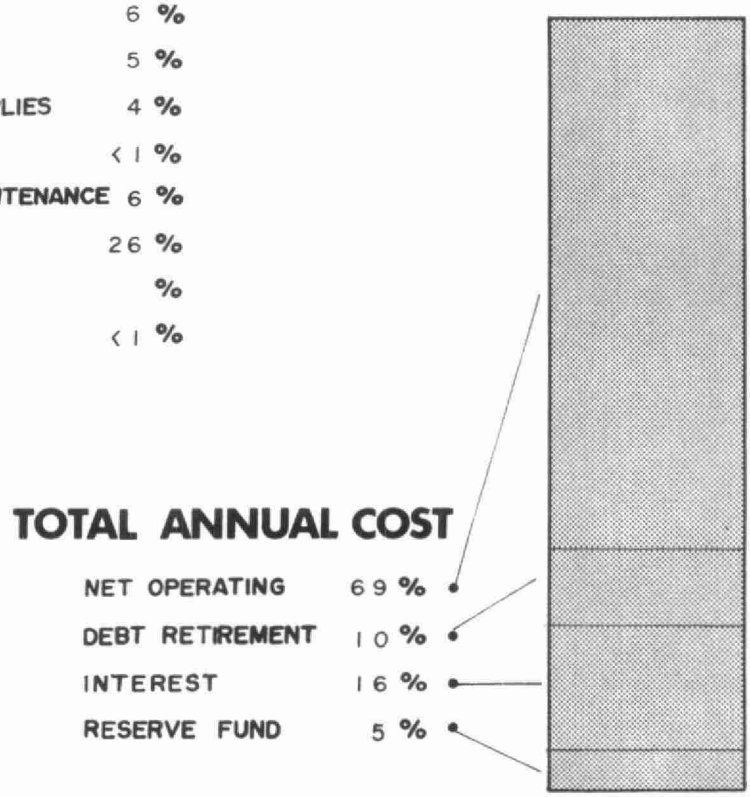
RESERVE ACCOUNT

Balance @ January 1, 1970	$ 23,700.38
Deposited by Municipality	4,269.62
Interest Earned	1,616.72
	$ 29,586.72
Less Expenditures	1,126.50
Balance @ December 31, 1970	$ 28,460.22

2-0250-68

NET CAPITAL COST (Final)	$10,927.88
DEDUCT - Portion financed by CMHC/MDLB (Final)	
Long Term Debt to OWRC	$10,927.88





Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1966	1131.0	31,647.82	27.93	2 cents
1967	1144.8	59,857.94	52.28	6 cents
1968	1020.0	54,186.55	53.00	6 cents
1969	1049.9	59,394.86	56.57	3 cents
1970	1182.5	63,815.38	53.97	5 cents

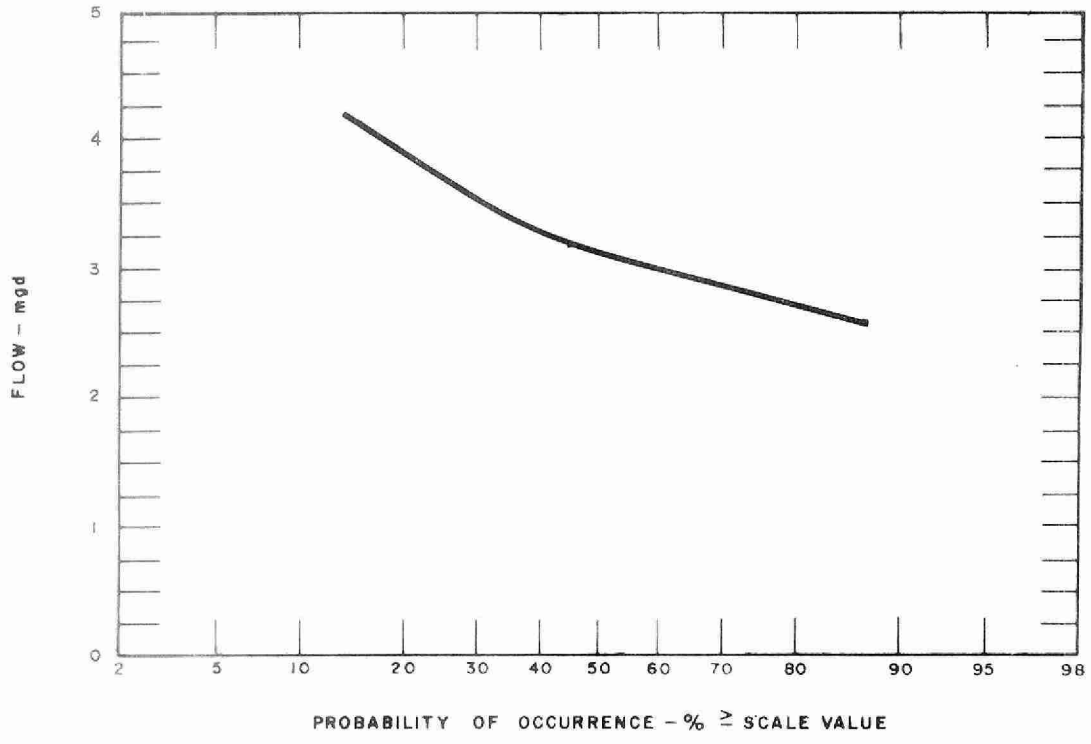
MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	5646.34	2608.24	510.94	255.03	361.96	-	118.55	23.45	797.76	970.41	-	-
FEB	4263.11	1948.86	-	482.26	385.07	-	99.00	270.78	75.49	861.84	-	139.81
MAR	4060.70	2010.35	256.24	250.64	352.84	-	64.22	-	279.45	846.96	-	-
APR	4386.22	1908.52	143.48	444.14	372.06	-	7.00	-	344.92	1166.10	-	-
MAY	5970.07	2241.02	735.82	321.77	347.71	-	260.82	-	399.08	1615.29	-	48.56
JUNE	3252.96	2040.38	318.36	338.23	-	-	50.28	-	386.78	118.93	-	-
JULY	8550.45	1832.57	308.66	260.79	736.18	1352.40	404.08	-	523.33	3132.44	-	-
AUG	6551.87	2782.48	462.84	267.74	290.74	1352.40	195.47	-	170.32	1029.88	-	-
SEPT	3529.66	1884.89	313.75	-	302.40	-	252.22	-	-	716.40	-	60.00
OCT	5719.91	1826.49	287.70	212.45	323.41	822.15	97.10	-	91.04	2119.57	-	(60.00)
NOV	4559.93	1916.20	161.11	531.41	-	-	214.69	-	587.34	1149.18	-	-
DEC	7324.16	1826.64	224.45	859.89	615.33	18.43	534.89	256.79	193.72	2794.02	-	-
TOTAL	63815.03	24826.64	3723.35	4224.35	4087.70	3545.38	2298.32	551.02	3849.23	16521.02	-	188.37

BRACKETS INDICATE CREDIT

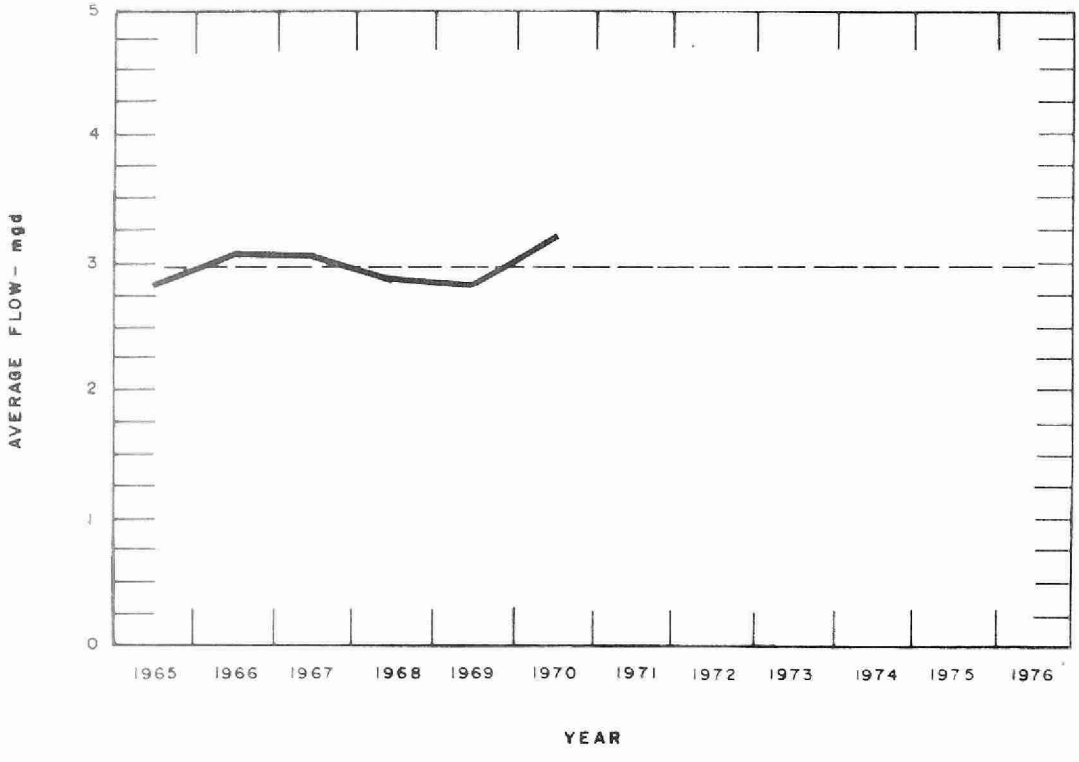
* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE $15,179.91

PROCESS DATA



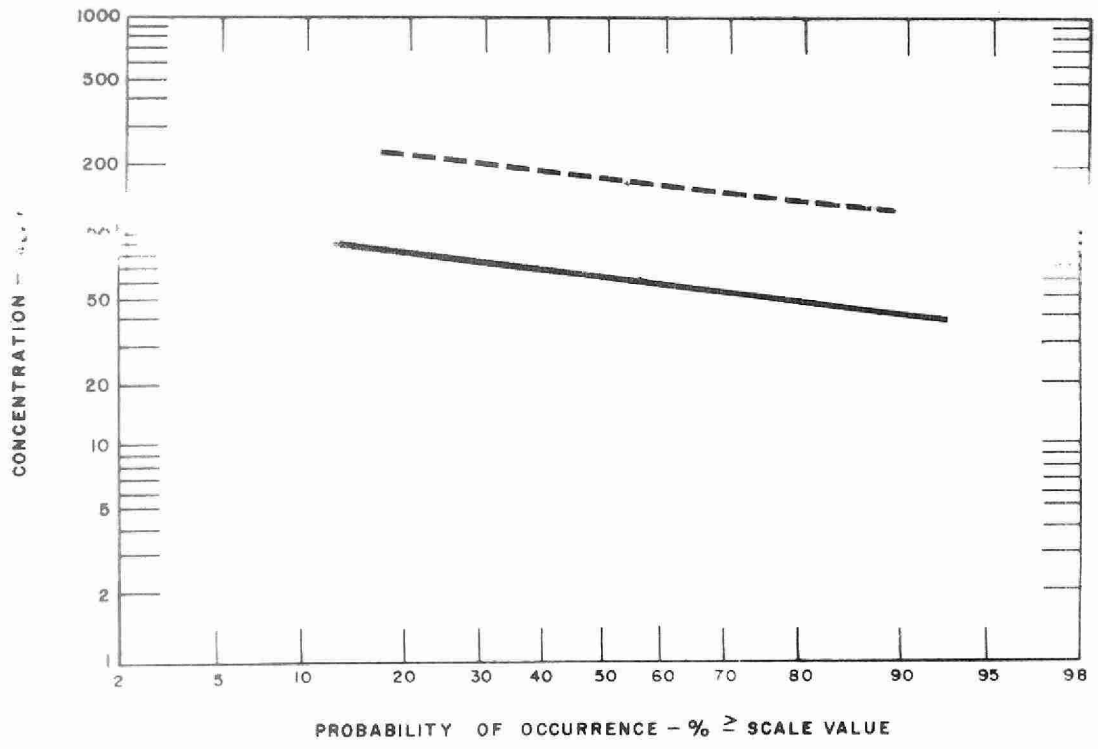
FLOWS

NOMINAL CAPACITY ——— ——— ———

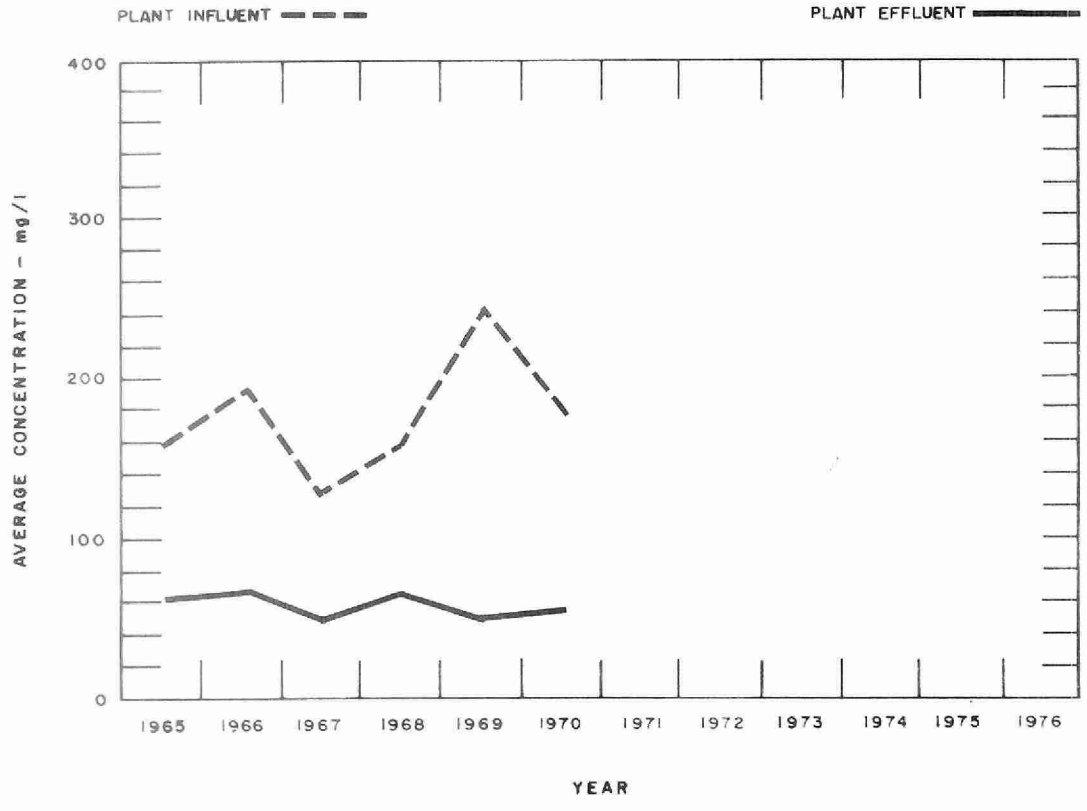


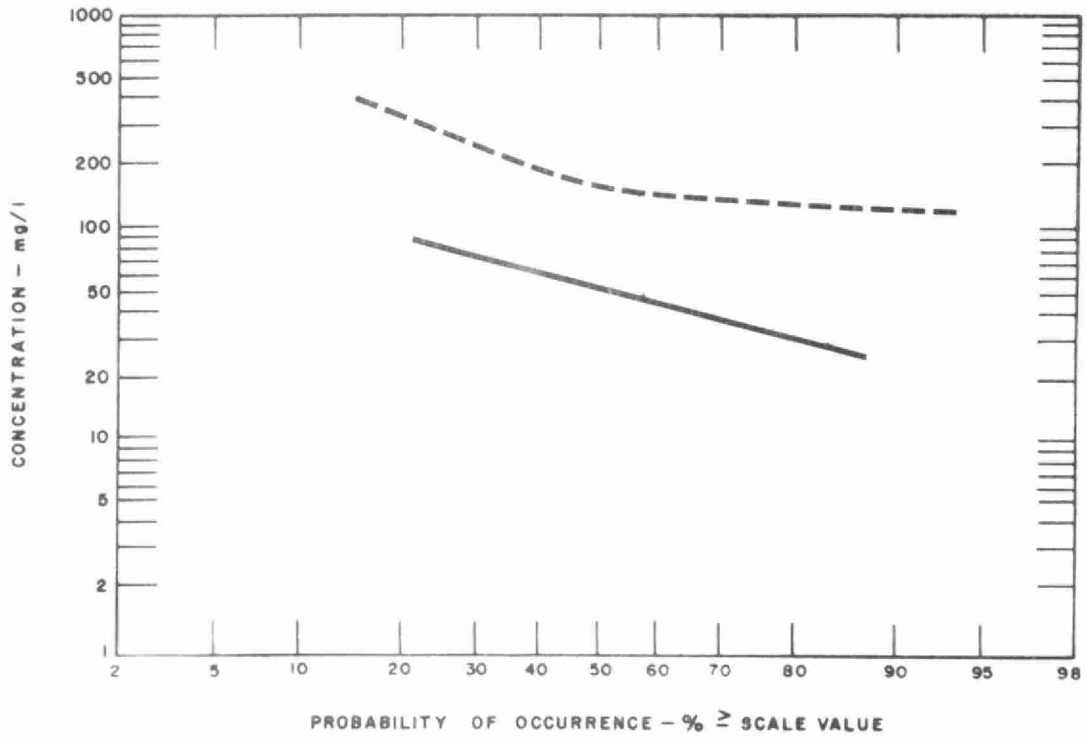
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED 10^3 pounds	DOSAGE mg/l
JAN	78.0	2.52	3.9	1.3	-	-
FEB	78.5	2.80	3.0	2.5	-	-
MAR	89.8	2.90	3.4	2.6	-	-
APR	108.1	3.62	4.3	2.8	-	-
MAY	110.3	3.56	4.1	3.1	3.1	5.5
JUNE	111.8	3.73	4.6	2.4	5.7	5.1
JULY	108.7	3.52	4.4	2.6	6.2	5.7
AUG	104.0	3.36	5.2	3.8	6.2	6.0
SEPT	107.4	3.58	4.4	1.6	6.0	5.6
OCT	85.8	2.77	3.2	2.3	5.2	6.0
NOV	87.9	2.92	3.6	2.1	0.2	5.8
DEC	112.2	3.62	5.8	2.3	-	-
TOTAL	1182.5	-	-	-	32.6	-
AVERAGE	-	3.24	-	-	-	5.6

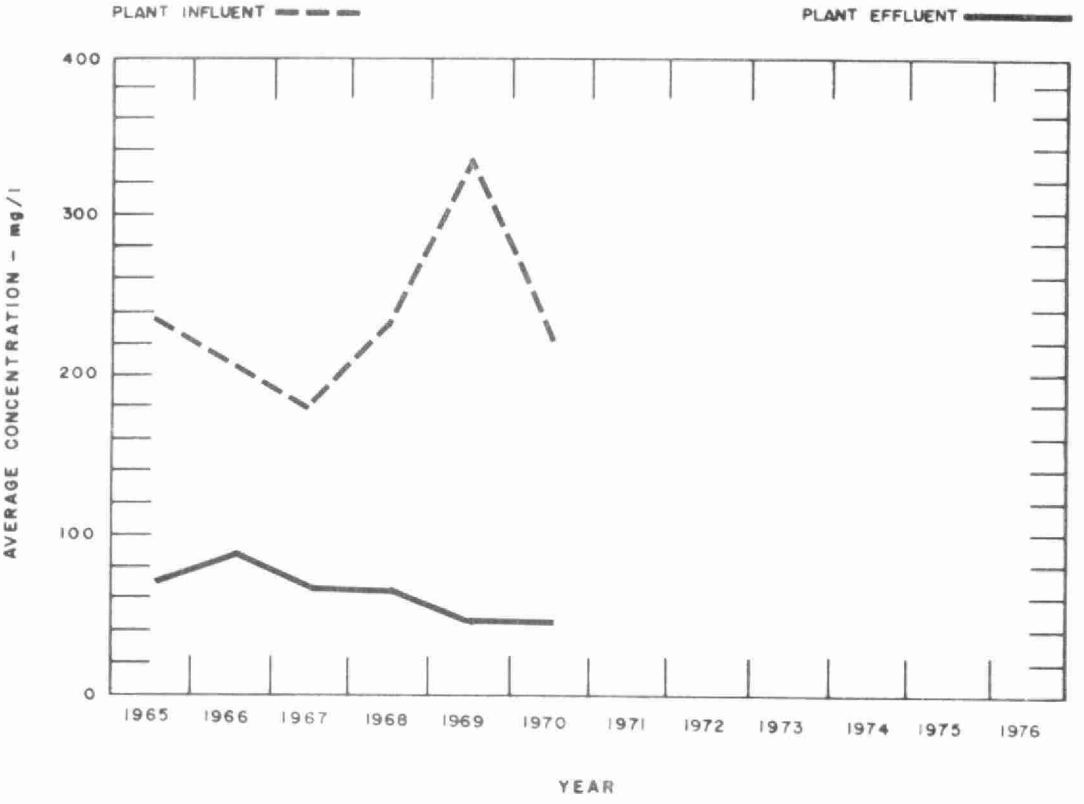


BIOCHEMICAL OXYGEN DEMAND





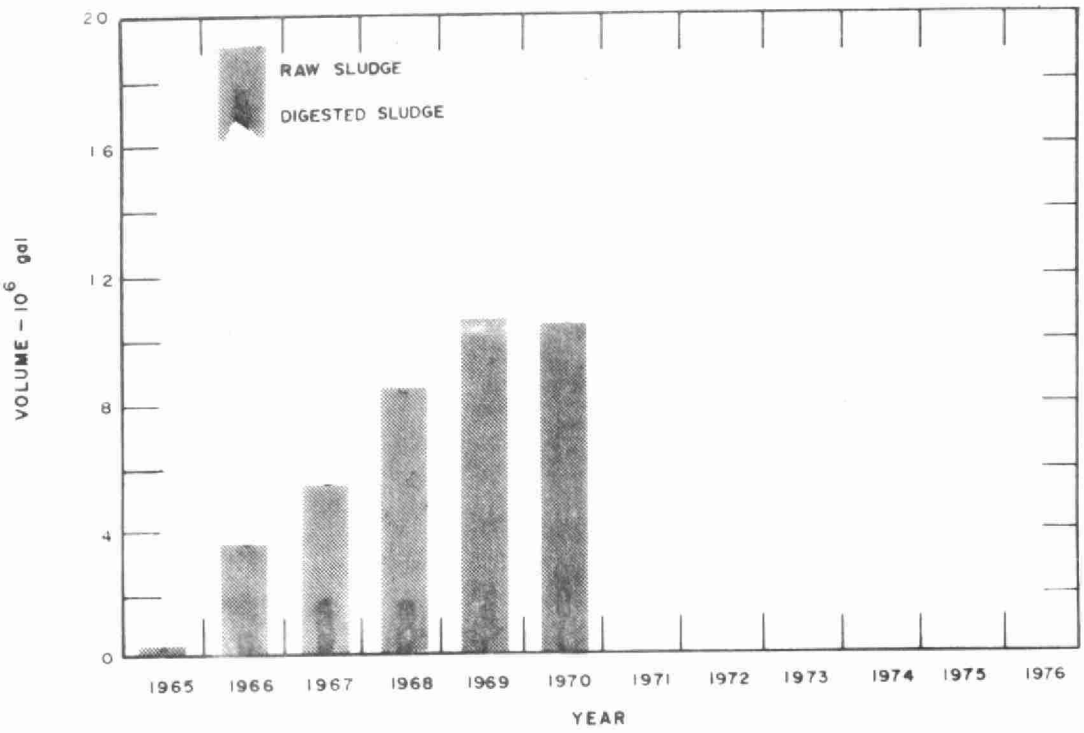
SUSPENDED SOLIDS



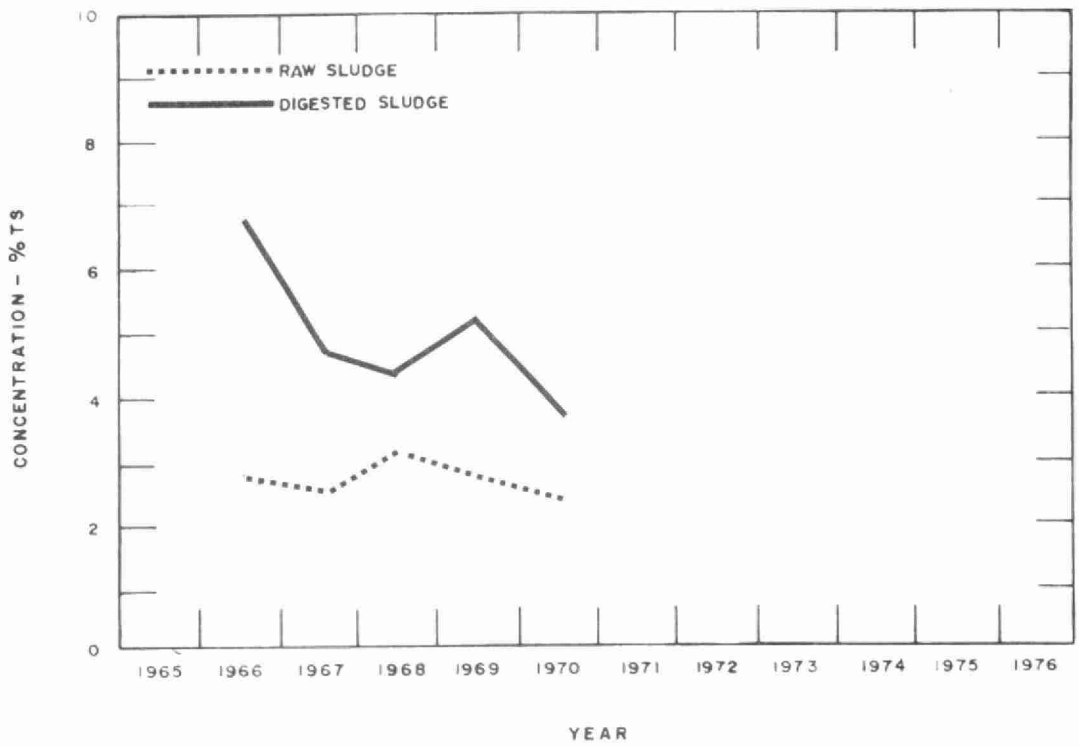
PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND						SUSPENDED SOLIDS						GRIT REMOVED
	INFLUENT		EFFLUENT		REDUCTION		INFLUENT		EFFLUENT		REDUCTION		
	n	mg/l	n	mg/l	%	10^5 pounds	n	mg/l	n	mg/l	%	10^5 pounds	cu ft
JAN	1	140	1	60	57	.6	1	290	1	75	74	1.7	200
FEB	1	210	1	25	88	1.4	0	-	1	50	-	-	200
MAR	2	220	2	70	68	1.3	2	218	2	70	68	1.3	300
APR	1	240	1	34	86	2.2	1	210	1	50	76	1.7	560
MAY	1	130	1	70	46	.7	1	140	1	70	50	.8	340
JUNE	3	140	3	74	47	.7	3	325	3	42	87	3.2	520
JULY	2	145	2	50	66	1.0	2	135	2	35	74	1.1	1030
AUG	2	165	2	39	76	1.3	2	147	2	38	74	1.1	740
SEPT	1	190	0	-	-	-	1	140	1	25	82	1.2	640
OCT	0	-	0	-	-	-	0	-	0	-	-	-	570
NOV	3	210	3	67	68	1.2	3	280	3	70	75	1.8	560
DEC	0	-	0	-	-	-	0	-	0	-	-	-	640
TOTAL	17	-	16	-	-	10.4	16	-	17	-	-	13.9	6300
AVERAGE	-	178	-	58	67	1.1	-	225	-	48	79	1.5	525

NOTE – n is the number of samples taken


RAW SLUDGE
DIGESTED SLUDGE
VOLUME – 10^6 gal
0
4
8
12
16
20
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
YEAR

DIGESTION


RAW SLUDGE
DIGESTED SLUDGE
CONCENTRATION – % TS
0
2
4
6
8
10
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
YEAR

SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME 10^5 gal	TOTAL SOLIDS %	VOL SOLIDS %	VOLUME 10^5 gal	TOTAL SOLIDS %	VOL SOLIDS %	VOLUME 10 gal	TOTAL SOLIDS %	DEWATERED cu yd	LIQUID cu yd
JAN	9.0	2.6	77	1.5	2.8	53	-	.1	-	878
FEB	8.1	2.4	72	1.4	2.9	65	-	-	-	809
MAR	9.0	2.4	79	2.0	5.5	58	-	.2	-	1193
APR	8.6	2.5	74	3.8	1.6	55	-	.2	-	2254
MAY	8.9	3.2	61	3.8	6.2	68	-	-	-	2241
JUNE	8.7	1.8	-	2.9	7.4	-	-	.2	-	1730
JULY	9.1	2.7	-	2.3	3.1	-	-	.2	-	1361
AUG	8.9	3.1	-	2.4	5.4	-	-	.1	-	1418
SEPT	8.6	1.6	-	2.5	1.1	-	-	-	-	1480
OCT	8.9	-	-	2.7	-	-	-	-	-	1598
NOV	8.6	3.1	69	2.8	1.9	67	-	.1	-	1663
DEC	8.9	-	-	4.2	-	-	-	-	-	2487
TOTAL	105.2	-	-	32.3	-	-	-	-	-	19112
AVERAGE	8.7	2.5	72	2.6	3.8	61	-	.2	-	1593

Water management in Ontario